OIPE
MAR 26 2004
PATENT & TRADEMARK OFFICE
JC659

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No.:	**ISPH-0790**
Inventors:	**Crooke et al.**
Serial No.:	**10/679,761**
Filing Date:	**October 6, 2003**
Examiner:	**Not Yet Assigned**
Group Art Unit:	**Not Yet Assigned**
Title:	**Methods of Using Mammalian RNase H and Compositions Thereof**

I, **Jane Massey Licata**, Registration No. 32,257, certify that this correspondence is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to the Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450

On this date: Marhc 24, 2004

Jane Massey Licata

Jane Massey Licata, Registration No. 32,257

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 C.F.R. §1.56 and in accordance with 37 C.F.R. §§1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 C.F.R. §1.56(b).

(XX) In accordance with §1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified

application, within three months of the date of entry into the national stage of the above identified application as set forth in §1.491, or before the mailing date of a first Office Action on the merits of the above-identified application, no additional fee is required.

( ) In accordance with §1.97(c), this Information Disclosure Statement is being filed after the period set forth in §1.97(b) above but before the mailing date of either a Final Action under §1.113 or a Notice of Allowance under §1.311, therefore:

( ) Certification in Accordance with §1.97(e) is attached hereto; or

( ) Authorization to charge Deposit Account No. 50-1616 the fee of $**180.00** as set forth in §1.17(p) is provided.

( ) In accordance with §1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under §1.113 or a Notice of Allowance under §1.311 but before the payment of the Issue Fee, therefore included are: Certification in Accordance with §1.97(e); Petition Requesting Consideration of the Information Disclosure Statement; and the fee of $**130.00** as set forth in §1.17(I)(1).

( ) Copies of each of the references listed on the attached Form PTO-1449 (modified) are enclosed herewith.

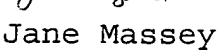
(XX) In accordance with §1.98(d), copies of some or all of the references listed on the attached Form PTO-1449 (modified) are not enclosed herewith because they were previously submitted to the U.S. Patent and Trademark Office in prior application Serial No. **10/358,439**, filed **February 3, 2003**; application Serial No. **09/992,738**, filed **November 14, 2001**; application Serial No. **09/781,712**, filed **February 12, 2001**; application Serial No. **09/861,205**, filed **May 18, 2001**; application Serial No. **09/684,254**, filed **October 6, 2000**; application Serial No. **09/343,809**, filed **June 30, 1999** and application Serial No. **09/203,716**, filed **December 2, 1998**, for which a claim for priority under 35 U.S.C. §120 has been made in the instant application.

Please charge any deficiency or credit any overpayment to Deposit Account No. 50-1619. This form is submitted in duplicate.

( ) The relevance of the listed references in a foreign language is as stated in the specification at pages @@.

(XX) All listed references are in the English language.

Respectfully submitted,



Jane Massey Licata
Registration No. 32,257

Date: March 24, 2004

Licata & Tyrrell P.C.
66 E. Main Street
Marlton, New Jersey 08053
(856) 810-1515

OIPE
MAR 26 2004
PATENT & TRADEMARK OFFICE
JC58

Form PTO-1449 Modified List of Patents and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISPH-0790	Application No. 10/679,761
	Applicant Stanley T. Crooke, et al.	
	Filing Date October 6, 2003	Art Unit Not Yet Assigned

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	1	Agrawal, S. et al., 1990, "Site-specific excision from RNA by RNase H and mixed-phosphate-backbone oligodeoxynucleotides" Proc. Natl. Acad. Sci. USA 87(4):1401-1405
	2	Blake et al., 1985, "Hybridization arrest of globin synthesis in rabbit reticulocyte lysates and cells by oligodeoxyribonucleoside methylphosphonates," Biochemistry, 24, 6139-4145
	3	Boado R.J. et al., 1994 "Complete inactivation of target mRNA by biotinylated antisense oligodeoxynucleotide-avidin conjugates" Bioconjug. Chem. 5(5):406-410
	4	Bordier, B. et al., 1995 "Sequence-specific Inhibition of Human Immunodeficiency Virus (HIV) reverse transcription by Antisense Oligonucleotides:Comparative Study in Cell-free assays and in HIV-infected cells", Proc. Natl. Acad. Sci. USA, 92:9383-9387
	5	Busen et al., 1977, "Ribonuclease H Levels during the Response of Bovine Lymphocytes to Concanavalin A", Eur. J. Biochem., 74, 203-208
	6	Busen, W., 1980, "Purification, subunit structure, and serological analysis of calf thymus ribonuclease H I" J.Biol. Chem, 255, 9434-9443
	7	Busen, W., and Hausen, P., 1975 "Distinct Ribonuclease H Activities in Calf Thymus", Bur. J. Biochem., 52, 179-190
	8	Busen, W., J. Biol. Chem., 1982 "The Subunit Structure of Calf Thymus Ribonuclease HI As Revealed by Immunological Analysis", 257, 7106-7108
	9	Cazenave et al., 1989, "Comparative inhibition of rabbit globin mRNA translation by modified antisense oligodeoxynucleotides", Nucleic Acid Res., 17, 4255-4273
	10	Cerritelli and Crouch, 1998, "Cloning, expression, and mapping of ribonucleases H of human and mouse related to bacterial RNase HI ," Genomics 53, 300-307
	11	Cerritelli et al., 2003, "Failure to produce mitochondrial DNA results in embryonic lethality in RNaseH1 null mice," Mol. Cell., 11, 807-815
	12	Cerritelli S.M. and Crouch, R.J., 1995, "The non-RNase H domain of Saccharomyces cerevisiae RNase H1 binds double-stranded RNA: magnesium modulates the switch between double-stranded RNA binding and RNase H activity," RNA, 1, 246-259
	13	Chiang, M.Y. et al., 1991, "Antisense oligonucleotides inhibit intercellular adhesion molecule 1 expression by two distinct mechanisms", J. Biol. Chem. 266(27):18162-18171
	14	Crooke, S.T. et al., 1995, "Kinetic characteristics of Escherichia coli Rnase H1: cleavage of various antisense oligonucleotide-RNA duplexes", Biochem. J., 312, 599-608
	15	Crooke,S.T., 2003, in Burger's Medicinal Chemistry, 6th ed., pp 115-166
	16	Crouch, R. J., and Dirksen, M. L., 1982, in Nuclease, Linn, S, M., & Roberts, R. J., Eds., Cold Spring Harbor Laboratory Press, Plainview, NY, 211-241
	17	Dagle J.M. et al., 1990, "Targeted degradation of mRNA in Xenopus oocytes and embryos directed by modified oligonucleotides: studies of An2 and cyclin in embryogenesis", Nucleic Acids Res. 18(16):4751-4757
	18	Dash et al., 1987, "Selective elimination of mRNAs in vivo: Complementary oligodeoxynucleotides promote RNA degradation by an Rnase H-like activity", Proc. Nat'l Acad. Sci. USA, 84, 7896-7900

EXAMINER	DATE CONSIDERED

Form PTO-1449 Modified List of Patents and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISPH-0790	Application No. 10/679,761
	Applicant Stanley T. Crooke, et al.	
	Filing Date October 6, 2003	Art Unit Not Yet Assigned

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	19	Dean, N.M. et al., 1994, "Inhibition of protein kinase C-alpha expression in human A549 cells by antisense oligonucleotides inhibits induction of intercellular adhesion molecule 1 (ICAM-1) mRNA by phorbol esters" J. Biol. Chem. 269(23):16416-16424
	20	Eder et al., Biochimie, 1993, "Substrate specificity of human RNase H1 and its role in excision repair of ribose residues misincorporated in DNA," 75, 123-126
	21	Elbashir et al., 2001, Genes Dev., "RNA interference is mediated by 21- and 22-nucleotide RNAs" 15, 188-200
	22	Elbashir et al., 2001, Nature, "Duplexes of 21-nucleotide RNAs mediate RNA interference in cultured mammalian cells," 411, 494-498
	23	Fire et al., 1998, Nature, "Potent and specific genetic interference by double-stranded RNA in Caenorhabditis elegans," 391, 806-811
	24	Frank et al. 1998, "Cloning of the cDNA encoding the large subunit of human RNase HI, a homologue of the prokaryotic RNase HII," Proc. Natl. Acad. Sci. USA, 95, 12872-12877
	25	Frank et al. 1998, "Cloning, subcellular localization and functional expression of human RNase HII ," Biol. Chem. 379,1407-1412
	26	Frank et al., 1994, "Purification and characterization of human ribonuclease HII", Nucleic Acids Res., 22, 5247-5254
	27	Frank et al., 1993, "Sensitive detection of low levels of ribonuclease H activity by an improved renaturation gel assay,"Biochem Biophys Res Commun., 196, 1552-1557
	28	Furdon, P.J. et al., 1989, "RNase H cleavage of RNA hybridized to oligonucleotides containing methylphosphonate, phosphorothioate and phosphodiester bonds", Nucleic Acids Res. 17(22):9193-9204
	29	Gagnor et al., 1987, "α-DNA VI:comparative study of α-and β-anomeric oligodeoxyribonucleotides in hybridization to mRNA and in cell free translation inhibition", Nucleic Acid Res., 15, 10419-10436
	30	Ghosh, M.K. et al., 1993, "Phosphorothioate-phosphodiester oligonucleotide copolymers; assessment for antisense application", Anticancer Drug Des. 8(1):15-32
	31	Giles R.V. et al., 1992, "Enhanced RNase H activity with methylphosphonodiester/phosphodiester chimeric antisense oligodeoxynucleotides", Anticancer Drug Des. 7(1):37-48
	32	Giles, R.V. et al., 1992, "Increased specificity for antisense oligodeoxynucleotide targeting of RNA cleavage by RNase H using chimeric methylphosphonodiester/phosphodiester structures", Nucleic Acids Res. 20(4):763-770
	33	Godard, G. et al., 1995, "Antisense effects of cholesterol-oligonucleotide conjugates associated with poly(alkylcyanoacrylate) nonoparticles", Eur. J. Biochem. 232(2):404-410
	34	Gottikh, M. et al., 1994, "Alpha beta chimeric antisense oligonucleotides; synthesis and nuclease resistance in biological media", Antisense Res. Dev. 4(4):251-258
	35	Hall, K. B., and Mclaughlin, L. W., 1991, "Thermodynamic and structural properties of pentamer DNA.DNA, RNA.RNA, and DNA.RNA duplexes of identical sequence," Biochemistry, 30, 10606-10613
	36	Hausen, P. and Stein, H., 1970, "Ribonuclease H. An enzyme degrading the RNA moiety of DNA-RNA hybrids," Eur. J. Biochem., 14, 278-283

EXAMINER	DATE CONSIDERED

Form PTO-1449 Modified List of Patents and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISPH-0790	Application No. 10/679,761
	Applicant Stanley T. Crooke, et al.	
	Filing Date October 6, 2003	Art Unit Not Yet Assigned

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	37	Hoke, G.D. et al., 1991, "Effects of phosphorothioate capping on antisense oligonucleotide stability, hybridization and antiviral efficacy versus herpes simplex virus infection", Nucleic Acids Res. 19(20)5743-5748
	38	Itaya et al., 1991, "Selective cloning of genes encoding Rnase H from Salmonella typhimurium, Saccharomyces cerevisiae and Escherichia coli rnh mutant", Mol. Gen. Genet., , 227, 438-445
	39	Itaya, M. and Kondo K., 1991, "Molecular cloning of a ribonuclease H (Rnase HI) gene from an extreme thermophile Thermus thermophilus HB8: a thermostable Rnase H can functionally replace the Escherichia coli enzyme in vivo", 19, 4443-4449
	40	Itaya, M., 1990,"Isolation and characterization of a second Rnase H (Rnase HII) of Escherichia coli K-12 encoded by the rnhB gene," Proc. Natl. Acad. Sci. USA, 87, 8587-8591
	41	Kanaya et al., 1991,"Importance of the Positive Charge Cluster in Escherichia coli Ribonuclease HI for the Effective Binding " J. Biol. Chem., 266, 11621-11627
	42	Kanaya, S., and Itaya, M., 1992, "Expression, purification, and characterization of a recombinant ribonuclease H from Thermus thermophilus HB8 ," J. Biol. Chem., , 267, 10184-10192
	43	Kane, C. M., 1988,"Renaturase and Ribonuclease H: A Novel Mechanism That Influences Transcript Displacement by RNA Polymerase II in Vitro", Biochemistry, 27, 3187-3196
	44	Katayanagi et al., 1993, "Crystal Structure of Escherichia coli Rnase HI in Complex with Mg^{2+} at 2.8 A Resolution: Proof for a Single Mg^{2} Binding Site", Proteins: Struct., Funct., Genet., 17, 337-346
	45	Katayanagi et al., 1990, "Three-dimensional structure of ribonuclease H from E. Coli", Nature, 347, 306-309
	46	Katayanagi et al., 1993, "Crystal structure of Escherichia coli RNase HI in complex with Mg2+ at 2.8 A resolution: proof for a single Mg(2+)-binding site," Proteins: Struct., Funct., Genet., , 17, 337-346
	47	Kawasaki E., 1985, "Quantitative hybridization-arrest of mRNA in Xenopus oocytes using single-stranded complementary DNA or oligonucleotide probes", Nucleic Acids Res. 13(13):4991-5005
	48	Lane et al., 1993, "NMR assignments and solution conformation of the DNA.RNA hybrid duplex d(GTGAACTT).r(AAGUUCAC)," Eur. J. Biochem., , 215, 297-306
	49	Lee C.H. et al., 1995, "Antisense gene suppression against human ICAM-1, ELAM-1 and VCAM-1 in cultured human umbilical vein endothelial cells", Shock 4(1):1-10
	50	Lima, W.F. and Crooke, S.T., 1997, "Binding Affinity and Specificity of Escherichia coli Rnase H1: Impact on the Kinetics of Catalysis of Antisense Oligonucleotide-RNA Hybrids", Biochemistry, 36, 390-398
	51	Lima, W.F. et al., 1997, "The Influence of Antisense Oligonucleotide-induced RNA Structure on Escherichia coli Rnase H1 Activity", J. Biol. Chem., 272, 18191-18199
	52	Liu P.K. et al., 1994, "Suppression of ischemia-induced fos expression and AP-1 activity by an antisense oligodeoxynucleotide to c-fos mRNA", Ann. Neurol. 36(4):566-576

EXAMINER	DATE CONSIDERED

OIPE JC56
MAR 26 2004
PATENT & TRADEMARK OFFICE

Form PTO-1449 Modified List of Patents and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISPH-0790	Application No. 10/679,761
	Applicant Stanley T. Crooke, et al.	
	Filing Date October 6, 2003	Art Unit Not Yet Assigned

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	53	Monia et al., 1993, "Evaluation of 2'-Modified Oligonucleotides Containing 2'-Deoxy Gaps as Antisense Inhibitors of Gene Expression", J. Biol. Chem., 266:13, 14514-14522
	54	Montgomery et al., 1998, "RNA as a target of double-stranded RNA-mediated genetic interference in Caenorhabditis elegans,"Proc. Natl. Acad. Sci. USA, 95, 15502-15507
	55	Nakamura et al., 1991, "How does Rnase H recognize a DNA-RNA hybrid", Proc. Natl. Acad. Sci. USA, 88, 11535-11539
	56	Pardi et al., 1981, "Comparative study of ribonucleotide, deoxyribonucleotide, and hybrid oligonucleotide helices by nuclear magnetic resonance ," Biochemistry, , 20, 3986-3996
	57	Quartin R.S., 1989, "Number and distribution of methylphosphonate linkages in oligodeoxynucleotides affect exo-and endonuclease sensitivity and ability to form RNASE H substrates", Nucleic Acids Res. 17(18):7253-7262
	58	Rong, Y. W. and Carl, P. L., 1990, "On the molecular weight and subunit composition of calf thymus ribonuclease H1,"Biochemistry 29, 383-389
	59	Rosolen A. et al., 1993, "Effect of over-expression of bacterial ribonuclease H on the utility of antisense MYC oligodeoxynucleotides in the monocytic leukemia cell line U937", Biochimie 75(1-2):79-87
	60	Saison-Behmoaras B.T. et al.,1991, "Short modified antisense oligonucleotides directed against Ha-ras point mutation induce selective cleavage of the mRNA and inhibit T24 cells proliferation", EMBO J. 10(5):1111-1118
	61	Scaringe et al., 1998, "Novel RNA Synthesis Method Using 5'-O-Silyl-2'-O-orthoester Protecting Groups," J.Am. Chem. Soc. 120, 11820-11821
	62	Stein, H. and Hausen, P., 1969, "Enzyme from calf thymus degrading the RNA moiety of DNA-RNA Hybrids: effect on DNA-dependent RNA polymerase" Science, , 166, 393-395
	63	Suck, D., and Oefner, C., 1986, "Structure of DNase I at 2.0 A resolution suggests a mechanism for binding to and cutting DNA," Nature, 321, 620-625
	64	Tidd, D.M. and Worenius, H.M., 1989, "Partial protection of oncogene, anti-sense oligodeoxynucleotides against serum nuclease degradation using terminal methylphosphonate groups," Br. J. Cancer, , 60, 343-350
	65	Tidd, D.M. et al., 1988, "Evaluation of N-ras oncogene anti-sense, sense and nonsense sequence methylphosphonate oligonucleotide analogues", Anti-Cancer Drug Des., , 3, 117
	66	Tijsterman et al., 2002, "RNA helicase MUT-14-dependent gene silencing triggered in C. elegans by short antisense RNAs," Science, 295, 694-697
	67	Timmons and Fire, 1998, "Specific interference by ingested dsRNA," Nature, 395, 854
	68	Timmons et al., 2001, "Ingestion of bacterially expressed dsRNAs can produce specific and potent genetic interference in Caenorhabditis elegans," Gene, , 263, 103-112
	69	Tuschl et al., 1999, "Targeted mRNA degradation by double-stranded RNA in vitro," Genes Dev., 13, 3191-3197
	70	Vickers et al., 2003, "Efficient reduction of target RNAs by small interfering RNA and RNase H-dependent antisense agents. A comparative analysis," J. Biol. Chem. 278, 7108-7118

EXAMINER	DATE CONSIDERED

Form PTO-1449 Modified List of Patents and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISPH-0790	Application No. 10/679,761
	Applicant Stanley T. Crooke, et al.	
	Filing Date October 6, 2003	Art Unit Not Yet Assigned

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	71	Walder, R.Y. and Walder, J.A., 1988, "Role of Rnase H in hybrid-arrested translation by antisense oligonucleotides", Proc. Nat'l Acad. Sci. USA, , 85, 5011-5015
	72	Wintersberger, U., 1990 "Ribonucleases H of Retroviral and Cellular Origin", Pharmac. Ther., 48, 259-280
	73	Woolf et al., 1990, "The stability, toxicity and effectiveness of unmodified and phosphorothioate antisense oligodeoxynucleotides in Xenopus oocytes and embryos," Nucleic Acids Res. , 18, 1763-1769.
	74	Wu et al., 1998, "Molecular cloning and expression of cDNA for human RNase H," Antisense Nucl. Acid Drug Dev., 8, 53-61
	75	Wu et al., 1999, "Properties of cloned and expressed human RNase H1," J. Biol.Chem. 274, 28270-28278
	76	Yang et al., 1990, "Structure of Ribonuclease H Phased at 2 A Resolution by MAD Analysis of Selenomethionyl Protein", Science, 249, 1398-1405

EXAMINER	DATE CONSIDERED

Form PTO-1449 Modified List of Patents and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISPH-0790	Application No. 10/679,751
	Applicant Stanley T. Crooke, et al.	
	Filing Date October 6, 2003	Art Unit Not Yet Assigned

U.S. PATENT DOCUMENTS

Examiner Initial		Patent No.	Date	Name	Class	Subclass
	77	6,001,653	12/14/1999	Crooke et al.	435	375

FOREIGN PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Country	Translation	
					Yes	No
	78					

EXAMINER	DATE CONSIDERED